Minutes
Conceptual Models of the Mission Space (CMMS)
Technical Working Group
Meeting 4

1. The fourth meeting of the CMMS technical working group was hosted by DMSO (Defense Modeling and Simulation Office) on 23 February 1996 in Alexandria, VA. Lt Col Mark Jefferson, Chief, Technology Applications Division, DMSO, chaired the meeting. A list of attendees is attached. Briefings will be posted on the DMSO World-Wide Web Home Page.

Introduction - DMSO

2. Lt Col Jefferson summarized the CMMS effort to date and introduced the Data Interchange Format (DIF) concept. The DIF concept is analogous to the Synthetic Environment Data Representation and Interchange Specification (SEDRIS). Further, a discussion of whom the major simulation programs are identifying as their authoritative data sources ensued.

3. Deliverables from the CMMS experiment phase were distributed.

Program Updates

4. Tim Rudolph commended the investigation by WARSIM of NASM's Conceptual Model of the User Space (CMUS) which describes the business processes of training delivery (vs. real world ops). This effort compliments the CMMS work but characterizes a different domain. CMUS:

a. Maps how, in the real world, models & simulations (as opposed to aircraft & munitions) are used for specific applications (e.g., training).
b. Primary benefit is not only simulation systems development & delivery but also new, efficient & innovative ways to use the systems.
c. Maps additional features or artifacts the simulation world must have that do not exist in the real world (real-time, halt, replay).
d. Primary methodology is process engineering/reengineering.
e. Baseline "as is" systems.
f. Model "to be" systems.

NASM/AP (CACI) is performing this activity for NASM, however the process models are leveragable to other activities and are being reviewed by the WARSIM program and others.

CMMS Technical Framework - Jack Sheehan

3. Jack Sheehan, Applied Research Laboratories, Univ. of Texas, briefed the current status of the CMMS Technical Framework, who would draft it and its tentative contents. Ideally the framework would be adopted by a flagship M&S project for further refinement. Practically however, it appears the framework will be shared with a development program that is underway but immature enough to be able to utilize portions of the framework. The framework will focus on authoritative data sources, common semantics and syntax, as well as implementation specifics.

It will serve as a basis for implementation work through a Concept of Operations, Technical Requirements and Constraints and a set of Interoperability Specifications.

Authoritative Data Sources

4. Lt Col Jefferson and Mr. Sheehan led a discussion among the programs on authoritative data sources. Authoritative sources are uniquely identified warfighters empowered to validate combat processes and resources (men and equipment) employment, operation, characteristics and performance. There is an authoritative initiative underway in the data standards branch of DMSO to provide broad support not only to CMMS but to the whole M&S community. The initiative is to identify, describe, and make available via the MSRR and WWW data sources and authoritative data sources (ADS) to support CMMS and the M&S Community. A list of 200 database sources have been identified by a DMSO ADS working group. These database sources are available now through the MSRR. A taxonomy consisting of 172 subcategories with definitions have been developed which allows providers of data to categorize their data they are providing and users to locate required data by executing keyword searches. In the next few months this initiative will be obtaining Component approval of the identified databases to determine which ones are ADS. The list of 200 databases will be expanded to include additional databases sources, ADSs, authoritative sources such as documents, doctrine, and existing database output formats. Another related data initiative is the development of a M&S Data Interchange Formats (DIF) which will be available through the MSRR. This will be a collection of existing data element standards, ADSs, database sources descriptions, output formats of databases, and input formats of models to support CMMS and the M&S community.

5. Three additional authoritative source issues raised by the programs were current multiplicity of sources, population of sources and linearity of sources. There are significant program concerns that while it is easy to assume that somewhere in DoD a single expert must be responsible for the performance of a platform, practically there are a number of models of many platforms in existence. They also voiced concern that designation of a single authoritative model may not occur strictly based on scientific evidence, as many political factors could enter the process. Lt Col Jefferson acknowledged the issue and advised the programs that the solution to this problem will be the designation of warfighters, each in charge of his own area of employment, as the single point of contact. It will be up to the warfighter authoritative source to resolve apparent differences in performance models and tactics and procedure. Mr. George Thompson also noted that while a data source may be designated as authoritative, that does not guarantee sufficient data fill will be available to support modeling and simulation. He noted that in the area of foreign representation there is a requirement for more data than the community could possibly produce. It was also noted that data is not linear - there are not only different formats but more especially different fidelities in different areas. These issues will require that the DMSO Technical Framework address a programmatic process for the designation of authoritative sources and that DoD-wide priorities be established to optimize future investment in additional fill and increased fidelity of source information.

6. Paul Driscoll discussed an authoritative source structure that is reflective of the Air Force chain of command, beginning with Air Force directives such as the 16-001 directive on air

operations. The list was more representative of things the Air Force thinks it needs to trace authoritative sources, rather than a completed work. The Air Force will share all its source information with DMSO as it is discovered. Lt Col Jefferson noted that DMSO, in turn, will provide back to the Air Force all sources discovered during the CMMS prototyping process. Although the CMMS prototypers are not engaged primarily in knowledge acquisition, they will do some as it becomes necessary to complete a representative CMMS "thread" through its proposed scope.

7. CDR Guy Purser noted that, historically, simulations like the RESA (Research, Evaluation and Systems Analysis) facility were contracted out and delivered with little concern for sources. The contractor hired military expertise and designed simulations accordingly. Traceability to valid sources of doctrine or procedure were not deliverable. The Navy well recognizes these past problems and is working hard not to repeat them. They are working for "Just-In-Time" delivery of validated operations knowledge for BFTT and STOW (Synthetic Theater of War). In the Navy most validation tasks will fall to the Fleet Project Team, though Navy Doctrine Command will prepare a list of who they think validation sources ought to be. These will primarily include the Navy's Warfare Area Centers of Excellence (such as Strike University, Top Gun, Top Dome, etc.). A candidate list was provided.

8. MAJ Rhinesmith summarized Army authoritative data source considerations, noting that designation primarily results from a staffing process to assign specific responsibility. Although TRADOC (Training and Doctrine Command) holds overall responsibility there are many Warfare Centers of Excellence and schools which will assume responsibility for their specific areas of warfighting. Memoranda of Understanding will designate doctrinal responsibility. The crux is the issue of whether the right people are sitting around the table to describe actual procedures.

CMMS Experiment Briefs and Demonstrations - Experiments Contractors

9. Briefings and software will be available on the DMSO World-wide Web Home Page and via electronic distribution.

Navy Conceptual Modeling - CDR Guy Purser

10. CDR Purser briefly discussed recent directions of the Navy's conceptual modeling efforts. The Navy's Modeling and Simulation organization flows from Admiral Davis at N-6 to CAPT Kistler (N-6M) and to functional area managers similar to the EXCIMS/MSWG structure but with the addition of a functional area for Doctrine (CDR Purser). Though Navy Doctrine Command (NDC) was tasked by Navy N-7 for knowledge acquisition for JSIMS (Admiral Wright), the task is well coordinated with N-6. NDC also provides doctrinal advice to Peggy Feldmann on the STOW research program with the aim of producing viable conceptual models as a basis for JSIMS and BFTT in the future. Whether STOW conceptual entities and processes will have traceable authoritative sources is questionable, however, since it is a research effort. STOW is however considered the fastest producer of conceptual models for the Navy, where they are building them as they need them. Most validation will be assigned to Naval Warfare Centers of Excellence, where their area of expertise is clear. Additionally, performance data is

provided by Fleet CINC's. Authoritative data is achieved in the absence of documentation through subject matter experts. Navy commands sign on the dotted line as having responsibility for subject matter expertise in particular missions or areas. That command then endorses the particular information to be the way the Navy does business. At the highest level of abstraction, the Navy expects to have a Navy METL (Mission Essential Task List) by March, though that could still change.

Common Semantics Working Group - Afternoon Session

11. Common Semantics Initiative. Dr. Bob Might introduced the concept of an integrating structure of commonly agreed upon semantic references as a tool to facilitate knowledge acquisition and especially to integrate knowledge from different KA projects. Because of the data fill problem referred to above additional tools are desperately needed to quickly and economically capture DoD processes. Specific instances of order-of-magnitude increases in efficiency were experienced in Bob's Domain Analysis lab at George Mason University using this semantic reference structure. The complete draft semantic structure will be made available to the community via our WWW server and additional information is available from Dr. Might. It should be emphasized that this common semantics structure is intended solely to be used as an internal tool for KA/KE (Knowledge Engineering) analysts and process model integrators. It is not proposed for, nor would it be ever recommended for, changing the language used by warfighters or the language written in doctrine. The KA representatives of current programs will be asked to provide samples of the terminology used by their warfighters and in their doctrine so the most common set of semantics can be derived from them. Once a standard (internal use) semantic structure is provided, either the KA analyst, with his tools, or the CMMS model integrator would link actual language usage to the common structure for permanent reference purposes.

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